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SITE NAME	**SAUGET AREA 1**
DOC ID #	**158060**
DOCUMENT VARIATION	**_ COLOR OR _X_ RESOLUTION**
PRP	**PRP - Monsanto Co.; RMD - Sauget Area 1**
PHASE	**SID**
OPERABLE UNITS	
PHASE **(AR DOCUMENTS ONLY)**	___ Remedial ___ Removal ___ Deletion Docket ____ ____ Original ____ Update #___ Volume __of __

COMMENT(S)

MAPS : Civil Site Plans & Plot Plans

FRC - 697

Route 3 Capping Project (1987) # 5

Bypass & U.
& Fig

1630200005 St Ck
Sauget
SF/Tech

Monsanto

Monsanto Chemical Company
500 Monsanto Ave.
Sauget, Illinois 62206-1198
Phone: (618) 271-5835

August 11, 1987

Mr. Bill Child
Manager
Division of Land Pollution Control
2200 Churchill Road
Springfield, IL 62706

Dear Mr. Child:

Enclosed for your information are the plans and specifications for the Route 3 Site Capping Project per our discussion with IEPA and USEPA-V on May 11, 1987. Our response to IEPA/USEPA-V comments (JL/WS, May 21, 1987) including additional study plans will be issued later this month. We are currently working with a contractor on a formal contract and health & safety plan for the capping project, and will inform you of our plans when they are firmed.

Sincerely,

Warren L. Smull
General Superintendent
Environmental Affairs

/cm

cc: Basil Constantelos, USEPA-V Chicago, IL
Jeff Larson, IEPA, Springfield, IL
Ken Mensing, IEPA, Collinsville, IL

Monsanto

Monsanto Chemical Company
500 Monsanto Ave.
Sauget, Illinois 62206-1198
Phone: (618) 271-5835

August 11, 1987

Mr. Basil Constantelos
Director
Waste Management Division
USEPA-V
230 S. Dearborn Street
Chicago, IL 60604

Dear Mr. Constantelos:

Enclosed for your information are the plans and specifications for the Route 3 Site Capping Project per our discussion with IEPA and USEPA-V on May 11, 1987. Our response to IEPA/USEPA-V comments (JL/WS, May 21, 1987) including additional study plans will be issued later this month. We are currently working with a contractor on a formal contract and health & safety plan for the capping project, and will inform you of our plans when they are firmed.

Sincerely,

W. L. Smull

Warren L. Smull
General Superintendent
Environmental Affairs

/cm

cc: Bill Child, IEPA, Springfield, IL

W. G. KRUMMRICH

SAUGET, ILLINOIS

ROUTE 3 SITE

CAPPING PROJECT

SCOPE OF WORK
Route 3 Drum Area
W.G. Krummrich Plant
Sauget, Illinois

The scope of this job is to provide all work and materials necessary for the capping of the Route 3 Drum Area. Monsanto will purchase the liner and installation supervision separately and expects this contractor to work with the liner vendor . The job is described more fully below and on the Drawings and Specifications listed herein as part of the project.

The area of the Drum Pit is about 42 feet by 250 feet. This area and an adjacent area are marked off and require special procedures to do any construction in the area. These requirements and the materials involved are set out in detail in Appendix A of the Specifications. This appendix is the Detailed Health and Safety Plan that was issued and used for the prior project to recover the buried drums.

The basic work consists of six phases. Phases 1 & 2 require Class B protective equipment as defined in Appendix A.

1 Place the previously excavated overburden which is stockpiled at the site back in the excavation and compact it to the required density, line and grades under the special health care conditions.

2 Placing a 6 inch (compacted) layer of clay over the entire contaminated area under special health care conditions.

3 Decontaminating all equipment involved in the above work and properly disposing of all the wastes generated.

4 Placing an additional 30 inches (compacted) of clay cap.

5 Co-ordinate the liner installation with the Vendor.

6 Placing the geodrain and geofabric over the liner and then placing and seeding the topsoil.

This work will be supervised in the normal manner by Monsanto and in addition Monsanto will have a Quality Assurance Officer at the job site. The Contractor is required to have a Health and Safety Plan and a Quality Control plan of his own and to have qualified personnel to implement them.

This site is known to the State and Federal authorities and visits by EPA and OSHA representatives can be expected.

The location of this site in Sauget, Illinois is on a portion of the W.G. Krummrich plant west of Illinois Route 3. It is in the south west corner of this parcel near the intersection of the Terminal Railroad and the Alton & Southern Railroad. The access is from Route 3 along the Alton & Southern RR.

The specifications are premised on the basis that driveway sized equipment will be used. This is due to the relatively small work area available.

A pre-bid inspection of the area from the adjacent railroads will be arranged for the prospective bidders. Entry to the site is prohibited unless the visitor arranges in advance with Monsanto and provides his own safety equipment and backup person.

There is a rather detailed report on the investigation that delineates the limits of the contaminated area that is available for inspection. Copies are not available but notes can be made. Please contact Mr. Warren L. Smull at the W.G. Krummrich plant for an appointment to review the report.

DRAWINGS

General Location Map CEA 8040 Dwg C1 Rev B

Civil Plot Plan (with Details) CEA 8040 Dwg C2 Rev B

List of Specifications

Compaction of Stockpiled Overburden	8040-1
Compaction of First Clay Layer	8040-2
Compaction of Main Clay Layer	8040-3
Liner and Installation to be provided by Liner Vendor	
Specifications for Geofabric Placement	8040-6
Topsoil Placement and Seeding	8040-7
Contractor Health & Safety Plan	8040-9
Contractor Decontamination Plan	8040-10
Construction Quality Assurance Plan	8040-11
Contractor Quality Control Plan	8040-12

Specification Exhibit A

The Health and Safety Plan used on the previous drum salvage job.

DEFINITIONS

Contractor	As in standard contract provisions.
Monsanto	As in standard contract provisions.
Vendor	The supplier and installer of the liner.
US EPA	United States Environmental Protection Agency
State EPA	Illinois State Environmental Protection Agency
OSHA	U.S. Occupational Safety & Health Act
HDPE	High Density Polyethelyene
NSF	National Sanitation Foundation
QAO	Quality Assurance Officer
FMTS	Federal Material Testing Standards
Geomaterials	Liners, Drainage Nets, Filter Fabrics of Plastic used to replace clay, sand, & gravel in construction
ASTM	American Society of Testing Materials

End of Scope of Work

1. GENERAL

1.1 Scope This specification covers the preparation of the site, and the placement and compaction of all loose and stockpiled overburden within the work area in preparation for the clay cap.

1.2 Adjustments to Plans Since the quantities are not precisely known the plans prepared may require some minor adjustment.The changes shall be approved by Monsanto.

1.3 Protection

1.3.1 Personnel The Health and Safety Plan required by Specification 8040-9 covers the special protection required on this site. The General Rules for Contractors on Monsanto Premises are in the main contract sections and also apply.

1.3.2 Drainage The contaminated area shall be bermed to prevent any run on of storm flow into the contaminated area and the run off of any water contaminated by waste. The water that is removed from the contaminated area shall be disposed of as set forth in Specification 8040-10.

1.3.3 Compaction Area The surface of unfinished fills shall be bladed smooth to a crown or grade at the conclusion of each day's work or before shutdown for any cause to permit the run off to flow to collection points within the contaminated area.

2. PRODUCTS

2.1 Materials This covers both the stockpiled material and the material excavated in this specification. The stockpile areas shall be undercut about 3 inches into undisturbed soil.

3. EXECUTION

3.1 (Omitted)

3.2 Excavation Soil shall be removed and reworked only as determined by proof rolling to provide a well prepared base for the remainder on the soil placement.

3.3 (Omitted)

3.4 (Omitted)

3.5 (Omitted)

3.6 Test Controlled Compacted - Fill

3.6.1 Preparation for Fill Before placing any fill the present surface must be scarified and proof rolled to assure an acceptable base for the fill placement. Soft spots shall be repaired and backfilled with other soil as specified for fill below.

3.6.2 Scarification Unless otherwise directed by Monsanto, the surface of areas to be filled shall be scarified to a depth of 1.5 to 3 inches and re-compacted with the next fill layer.

3.6.3 Placing of Fill Fill shall be placed in uniform layers that do not exceed the depth at which uniform compaction to the required densities can be obtained with the equipment being used. Each layer of fill shall be thoroughly compacted prior to placing the next layer.

Fill that has become saturated with water and does not meet the densities required shall be removed and reconditioned to conform to this specification. Both Monsanto and the Quality Assurance Officer (QAO) shall be notified of any removal and rework.

3.6.4 Compaction Each layer of fill shall be compacted to a density of not less than 95 % of the maximum density as determined by the special test method set forth in this specification. Material shall be moistened or aerated to dry as needed to meet this requirement.

3.6.5 Testing A density test and a moisture content test for each layer shall be conducted for each 1000 square feet. Other testing shall be as required by Specifications 8040-11 and 8040-12. Testing of this layer shall be by the ASTM Methods set out in Section 3.6.6 .

3.6.6 Test Method Since laboratory test methods are not practical an alternative method for determining maximum practical density and the related water content is necessary.

The density of the in-place soil shall be determined by ASTM D2922 and the moisture content by ASTM D3017. These involve nuclear instruments for on-site use.

The Contractor shall run at least 6 test compaction areas of the contaminated soil using the equipment planned for the project. These shall be at varying moisture contents and increasing compaction efforts.

Monsanto shall review the data from these field tests the contractor's recommended density that represents 95 % of the maximum obtainable. Monsanto shall concur with the density or direct, by a change order, more test to try for better compaction. The final selected 95 % of optimum density shall become the minimum allowable density for this layer of fill.

3.7 Fill Placement Filling shall be performed in a logical sequence to minimize the intermixing of the compacted soil and the compacted soil previously placed. Fill shall not be placed on muddy or frozen surfaces. The layer shall be moistened or dried by aeration as needed to secure the required compaction. The compaction effort shall be applied uniformly over the entire surface as it is being placed.

End of Spec. 8040-1

1. GENERAL

1.1 Scope This specification covers the placing and compaction of the first clay layer over the stockpiled soil placed and compacted under Spec. 8040-1. The clay material to be placed is identical to that specified for the remainder of the cap in Spec. 8040-3.

1.2 Protection

1.2.1 Personnel The Health and Safety plan required by Spec. 8040-9 covers the special protection required on the site during this work.

1.2.2 Drainage The drainage requirements of Section 1.3.2 of Spec. 8040-1 shall also apply to work under this Spec.

1.2.3 Compaction Area The grading requirements of Section 1.3.3 of Spec. 8040-1 shall also apply here.

2. PRODUCTS

2.1 Materials The material placed in this section shall conform to and be from the same source as that to be used for Spec. 8040-3.

3. EXECUTION

3.1 Test Controlled Compacted-Fill

3.1.1 Preparation for Clay Fill The top 1 1/2 to 3 inches of the compacted stockpiled soil shall be scarified prior to placing any loose clay fill. The loose clay fill shall be placed starting at a clean access area and dumped onto the edge of the scarified area. Clean equipment shall be used to push the clay fill onto the compacted area maintaining a 6 inch (Loose) cover. This shall be lightly compacted and then additional clay fill placed as required to provide a 6 inch (Compacted) layer.

Care shall be used to prevent any of the previously compacted soil from reaching the top of this layer. The clay shall be compacted to 95 % of maximum obtainable density as determined by the tests outlined in Section 3.6.5 of Spec 8040-1. The clay shall be placed from 1% to 3 % above optimum moisture as determined above.

3.1.2 Inspection Inspection of the densities and moisture content shall be performed as required in the Spec. 8040-11 and 8040-12. There shall be at least one test of each kind for each 2500 square feet of this layer.

3.1.3 Optimum Density Curve A density vs water content curve for the clay material shall be prepared according to ASTM Standard D 698 and made available to Monsanto and the QAO prior to the start of the work on this layer.

End of Spec, 8040-2

1. GENERAL

1.1 Scope This specification covers the construction of the main portion of the clay cap. It also includes the finish grading necessary to prepare the capped area for the placement of the HDPE liner covered by Spec 8040-5.

1.2 Protection

1.2.1 Protection This work shall be assumed to be free of the special protection required by Spec. 8040-9 and is covered by the general Monsanto Site Work Rules that are in the main contract sections.

Test work on the air above the first clay layer will be made by Monsanto prior to the start of any work covered by this Spec. If any changes are required Monsanto will provide written notice to the Contractor. Copies of the test results will be provided by Monsanto to the QAO and the Contractor along with written approval to start this portion of the work.

1.2.2 Drainage The berms required for Spec. 8040-1 shall be removed and all run-off shall be directed to the existing ditch and swale system. Care shall be used to maintain good drainage to prevent wet spots in the work area.

1.2.3 Compaction Area The surface of unfinished fills shall be bladed smooth to a crown or grade at the conclusion of each day's work or before shutdown for any cause, to permit the run-off of water.

2. PRODUCTS

2.1 Materials

2.1.1 Clay Material The Contractor shall be responsible for providing all of the material required for the clay cap. This material shall be from one relatively uniform source. Clay as used herein shall meet all of the following requirements.

The laboratory constant head permeability of recompacted samples shall be less than 5×10^{-6} cm/sec.

2.1.1 Clay Material Continued

At least 30 % by weight shall pass a No. 200 Sieve.

The liquid limit shall be equal to or greater than 30.

The plastic index shall be equal to or greater than 15.

The Clay fill must provide (when compacted under field conditions and at or above optimum moisture) a in place permeability of less than 1 x 10^{-7} cm/sec as determined by the standard falling head permeability method to be acceptable.

2.1.2 Borrow Source The Contractor shall include the planned source of clay material in his proposal. He shall also provide some verification of his reason for expecting the material to comply with this specification such as its use in other similar caps or liners.

3. EXECUTION

3.1 Test Controlled Compaction-Clay Fill

3.1.1 Scarification Unless otherwise directed by Monsanto, the surface areas to be filled shall be scarified from 1 to 3 inches prior to the addition of any clay fill.

3.1.2 Placing of Clay Fill Clay fill shall be placed in uniform layers not exceeding 9 inches (loose) or the depth at which uniform compaction of the entire layer, to the density required, can be obtained with the compacting equipment being used. Each layer shall be completely compacted and tested prior to the placement of the next layer.

Clay fill that has become saturated with water shall be removed to a depth determined by Monsanto. The removed material shall be reconditioned and replaced to conform to this Specification or disposed of as permitted by Monsanto.

3.1.3 Compaction Each layer of clay fill shall be compacted to a dry density not less than 95 % of the maximum dry density as determined by ASTM Standard D 698. The fill shall be at 1 to 3 % above optimum moisture during the compaction period. The in place moisture can be determined by ASTM method 3017 or other ASTM Methods for field moisture testing.

3.1.4 Inspection and Testing Testing of the compacted density and moisture shall be done by the Contractor with the presence of the QAO and the results provided to the QAO and to Monsanto.

Test Schedule

Density :
Once for each 2500 square feet of fill in each layer with a minimum of at least once in mid-morning and once in mid-afternoon.

Moisture :
At least once each hour of work.
Once with each Density test.

Samples :
Samples shall be taken at mid-depth of each layer.

Rejection :
Fill sections failing to meet these specifications shall be removed and reworked or replaced until the required density is obtained.

Test Fill :
Prior to the placement of any layer under this Specification, the contractor shall build a test fill using the materials and methods planned for this work. This test fill is set forth in detail in Spec. 8040-11. This test fill must pass the falling head field percolation test with results of less than 1×10^{-7} cm/sec.

End of Spec. 8040-3

1. GENERAL

This section covers the placement of two layer geofabric over the entire liner area to provide drainage of soil water to the sides of the cap. This consists of the placement of a HDPE drainage net over the liner followed by a geotextile filter fabric over the net. After the installation of these fabrics is completed the topsoil is placed as set out in Spec. 8040-7.

2.Materials

2.1 GeoMaterial The drainage net shall be HDPE and shall have a permeability of 0.3 cm/sec when tested by the constant head method. The filter fabric shall be a non-woven needle punched polypropylene material designed for use in hazardous waste system conditions. It shall be Bidim U-34, Exxon 225 D, or Trevira 1127 or Monsanto approved equal.

3. PLACEMENT

3.1 The drainage net and the filter fabric shall be manually placed over the liner following written instructions from the item's manufacture. The liner Vendor shall provide written instructions on the shoes required for the workers and any other precautions needed to protect the liner . The Contractor shall be responsible for thr repair of any damage to the liner. The repairs shall be done by the Vendor, at the contractor's expense.

End of Spec 8040-6

1. GENERAL

1.1 Scope This specification covers the placement of a topsoil layer, its compaction and the seeding and erosion control required of the Contractor.

The entire cap area is to be covered with topsoil and then seeded and mulched.

1.2 Certificates Provide two copies of the manufacturer's certificates of analysis of all soil amendments used, for all fertilizers used and for the seed used. The Contractor shall within two weeks of bid award submit the proposed top soil source and state that two samples have been submitted to either a consulting laboratory or the US Soil Conservation Service or the County Agent for analysis and recommendations as to preparation and seeding and planting methods.

2. PRODUCTS

2.1 Topsoil The Contractor shall provide the topsoil from an off site location. The topsoil shall meet ASTM D2488 requirements for one of the following types: Lean Clay with Sand, Sandy Lean Clay, Sandy Silt, Sandy Elastic Silt, Elastic Silt, Organic Soil, Organic Soil with Sand, or Sandy Organic Soil.

The topsoil is to be placed in layers and compacted moderately to prevent erosion. Additives required by the analysis required in 1.2 above shall be mixed in prior to placing. The contractor shall be very careful not to damage the liner system. Repairs shall be by the Vendor at the Contractor's cost.

2.2 Seeding The Contractor shall seed the site in accordance with the recommendations required in 1.2 above. If the season is so wet or cold that seeding is not practical then mulching or erosion control netting shall be placed at no extra cost to Monsanto until the seeding can be done.

End of Spec. 8040-7

Specification 8040-9
Contractor Health and Safety Plan

1. GENERAL

1.1 Bid The contractor shall provide in his bid a statement that he is experienced in Hazardous Waste Area work and that he has the necessary staff including Industrial Hygiene specialists.

1.2 Plan Within two weeks of the bid award, the Contractor shall provide Monsanto with a copy of his proposed Health and Safety Plan. It shall outline the training to be given the workers, the methods of work progress and the health and safety equipment to be provided at the site.

This plan shall be based on the contractor's experience and on the data included in Specification Exhibit A. It shall discuss how the contamination is going to be confined to the work area and the area to be capped. Decontamination and disposal of materials shall be covered under Specification 8040-10.

1.3 Review and Acceptance The Monsanto review and acceptance of the plan as submitted or as modified shall not convey to Monsanto responsibility for the plan. This acceptance only shows that the plan covers all hazards that Monsanto is aware of or has reason to suspect the presence of.

2. DAILY CHECKUP OF WORK

2.1 Daily Meeting There shall be a daily meeting between the Contractor, Monsanto, and the Construction Quality Assurance Officer covering the work done to date and the work planed for the next two working days. This discussion shall include the alternates needed for the probable weather.

2.2 Tailgate Meeting The contractor shall have a daily meeting with all of the workers on the site to serve as a reminder of the special work conditions and general need for safety in the work place.

3.0 MEDICAL RECORDS

3.1 Medical Tests The medical tests and all follow up items included in Specification Exhibit A are to be followed as if included herein.

End of Spec 8040_9

Specification 8040-10
Contractor Decontamination Plan

1.GENERAL

The contractor shall provide with the bid an outline of the equipment that probably will be used on the site during the contaminated work stage. He shall indicate briefly his overall work plan to avoid spreading the contamination. He shall also indicate what methods will be used to decontaminate the equipment as the area is transferred to 'clean' status.

The contractor shall also include an outline of the estimated amounts and kinds of materials he expects to generate. Any contaminated material shipped offsite for disposal shall be done by Monsanto and not the contractor.

The contractor shall provide two detailed decontamination plans used at prior sites so that Monsanto can judge his experience in this field.

1.1 Detailed Decontamination Plan The contractor shall provide a copy of a more detailed decontamination plan that is site specific after the contract award but prior to the start of work. This shall be approved by Monsanto prior to its use to end the contaminated work phase. All contaminated materials shall be handled as directed in Specification Exhibit A.

End of Spec. 8040-10

1. GENERAL

The purpose of the Construction Quality Assurance Plan is to provide an independent check on the quality of the work so that the public agencies involved are assured of the reliability of the test work.

1.1 Responsibility The Quality Assurance Officer (QAO) selected by Monsanto, shall conduct tests independent of those set forth in the specifications to verify the quality of the construction. He shall also be present at all contractor testing and be given a copy of the results for his file. The detailed as-built drawings showing all contractor tests are the Contractor's responsibility.

The QAO shall prepare a written summary of his day by day observations and test's and provide a final certified letter that the work conforms to the plans and specifications.

1.2 Authority The QAO shall have the authority to issue a written order shutting the job down if discussions between the QAO, the Contractor, and Monsanto have not arrived at acceptable ways to remedy or repair out of spec work. Copies shall be hand delivered to the Contractors senior person at the site and to the senior Monsanto person at the site. Copies shall also be mailed to the record addresses of each as provided the QAO at the start of work.

1.3 Guidelines The QAO shall use as a guideline for his work the applicable portions of EPA Document 530-SW -85-021 (Draft) entitled 'Construction Quality Assurance for Hazardous Waste Land Disposal Facilities.

1.4 Forms and Records The QAO shall present to Monsanto and to the Contractor copies of the forms that he plans to use at the job. Daily filled in copies will be provided to both at the next morning's status and progress meeting.

End of Spec 8040-11

1. GENERAL

The contractor shall return with the bid an outline of what field testing, such, as but not limited to, pocket penotrometer etc. test he plans to use to assure that the work is being properly done between the tests required elsewhere in the specifications. This can include such items as requiring a minimum number of passes with the equipment, etc.

1.1 Clay Cap The contractor shall construct a test area cap at least 24 inches thick as outlined in the EPA 'Quality Assurance' Manual referenced in Spec. 8040-11 and detailed in Specification 8040-2 Section 3.6.6.

1.2 Liner Control

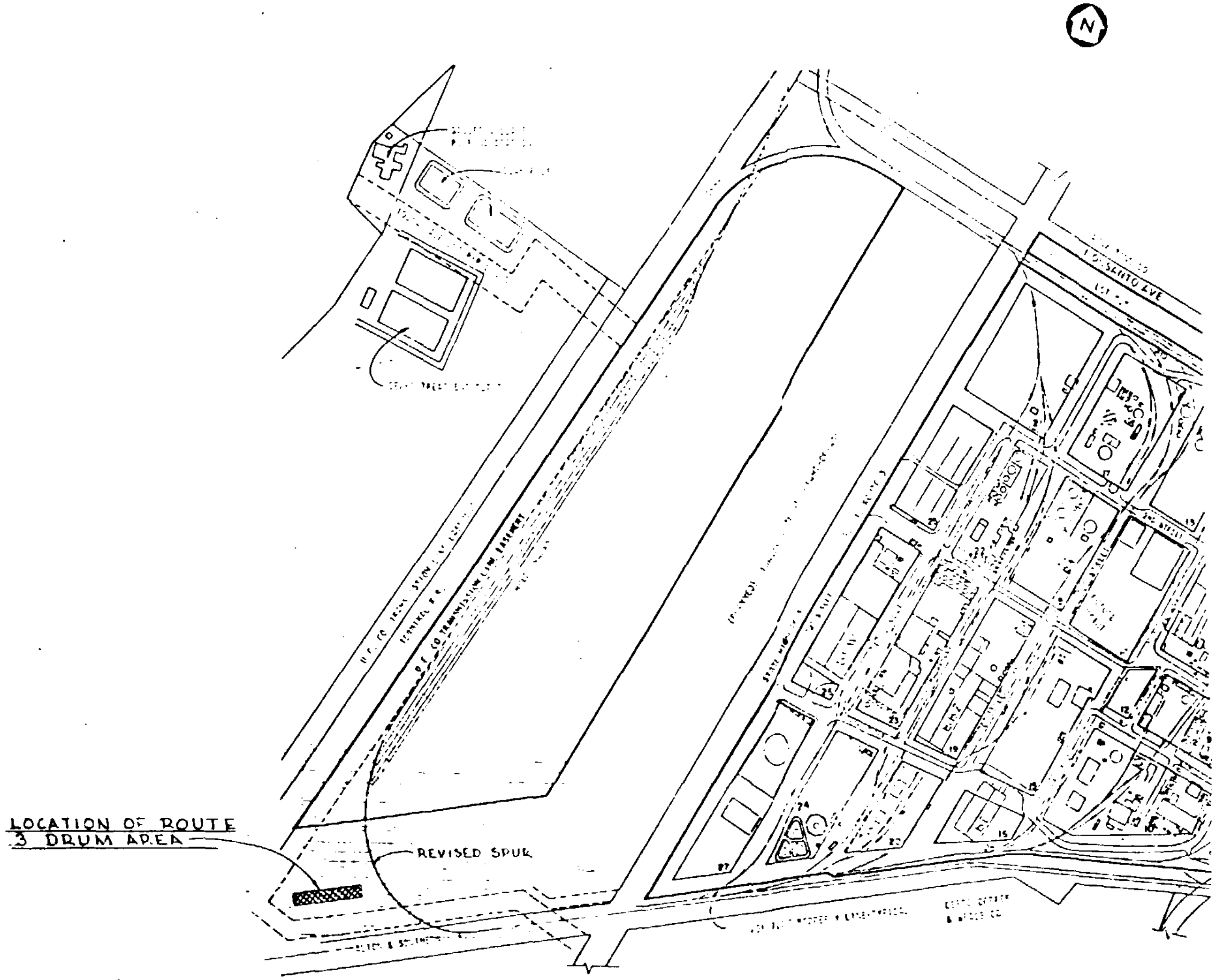
The liner Vendor shall be responsible for all quality control of the liner during its installation. The Contractor shall provide such assistance to the liner Vendor as has been arranged between them outside this scope of work.

1.3 Follow-up Work

On the completion on the liner or sections thereof, the contractor shall place the rest of the cap over the liner. His work shall be done in such a maner as to prevent any damage to the liner by his actions.

Any damage discovered during construction after the liner has been placed and accepted by Monsanto shall be repaired by the liner Vendor at the expense of the Contractor.

End of Spec. 8040-12



B	ISSUED FOR BID
A	REVIEW

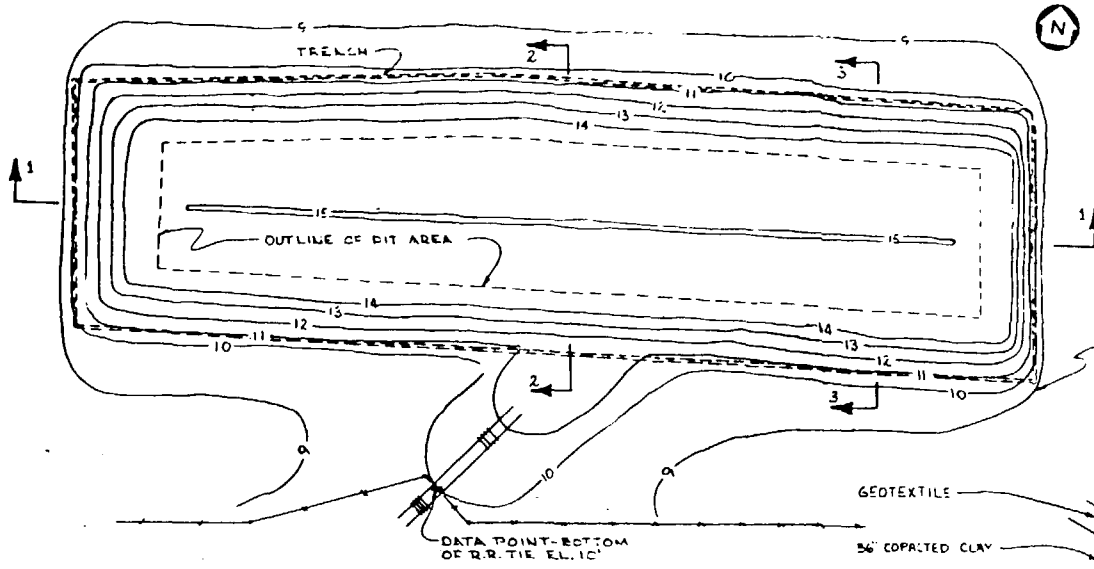
Monsanto — Monsanto Company, Corporate Engineering Dept., St. Louis, Missouri

COMPANY CONFIDENTIAL

M.C.C. — W.G. KRUMMRICH

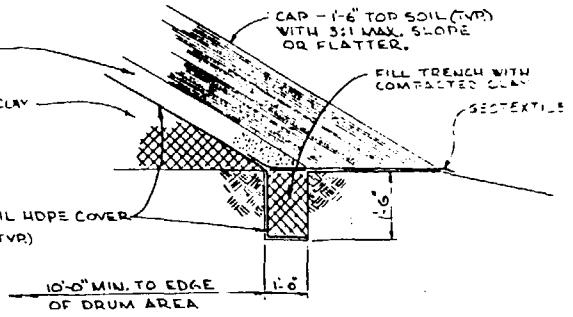
CIVIL
SITE PLAN
ROUTE 3 DRUM AREA

5040 03 D 00.000 C 1

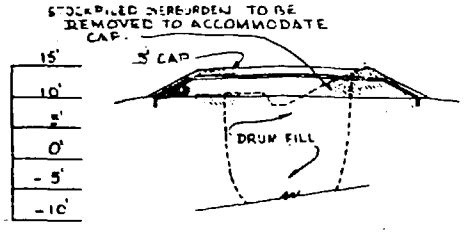


GRADING PLAN
SCALE: 1" = 20'

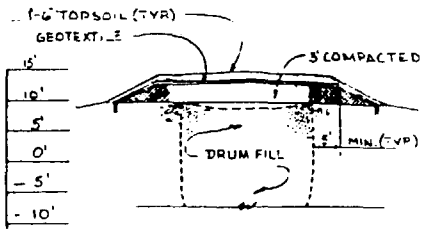
NOTES:
1. GRADE ELEVATIONS GIVEN INCLUDE SOIL CAP. EXCAVATE PIT AREA TO ACCOMMODATE ELEVATIONS.



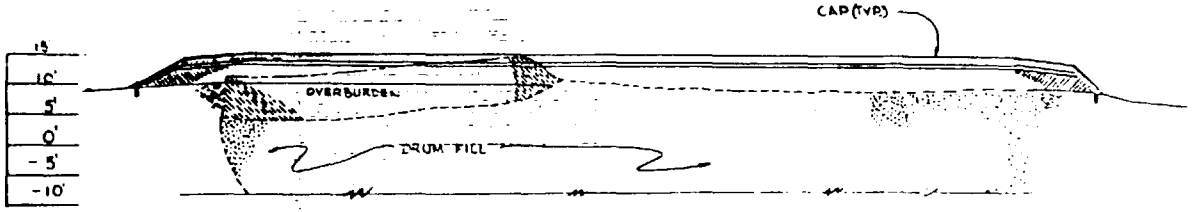
TYPICAL SECTION @ TRENCH



SECTION 2-2



SECTION 3-3



SECTION 1-1

B	-		ISSUED FOR BID
A	-		REVIEW

Monsanto
MONSANTO COMPANY
CORPORATE ENGINEERING DEPT.
ST. LOUIS, MISSOURI

COMPANY CONFIDENTIAL

MCC | W.C. REINHARDT

CIVIL
PLOT PLAN
ROUTE 3 DRUM AREA

5040	03	D	00.000	C	2	B	

W. G. KRUMMRICH

SAUGET, ILLINOIS

ROUTE 3 SITE CAPPING PROJECT

LINER PORTION

1.0 General

1.1 Vendor Experience The prospective Vendor shall include with his submittal a list of at least 20 projects on which he has provided and installed a similar liner.

1.2 Vendor Qualifications The Vendor must be listed by the National Sanitation Foundation (NSF) as meeting their Standard 54 for HDPE liner manufacturing.

1.3 Vendor to Provide The Vendor is to provide all the necessary material to provide a liner over the area to be capped including allowances for seaming and trench burial. The Vendor is to provide a layout drawing showing the sheet numbers used and their position in the field. The vendor is to provide receiving and storage instructions at least two weeks prior to the shipment of the material. All liner rolls or bundles shall be clearly marked with the Vendor's name, Job No. 8040, and the sheet number as shown on the layout drawings.

1.4 Vendor Sheet Width The sheets as shipped to the field shall be at least 20 feet wide and shall have no more than one factory seam.

2. LINER MANUFACTURE

2.1 Material The High Density Polyethylene (HDPE) shall be manufactured from virgin resin. The resin sources shall be Phillips TR400 or Chevron 9642. Carbon Black, anti-oxidants and heat stabilizers shall not exceed 2.5% by weight of the finished liner.

2.2 Material Tests The Vendor shall certify that the material used to manufacture the liner meets the following tests.

ASTM D1505	Density	0.935	
ASTM D1238	Melt Index	Procedure A (190 °C)	Condition E 2100
			Condition P 4700

Samples of the production run shall be taken and tested according to ASTM D638 and tested at Yield and Break for Tensile Strength and Elongation.

A Quality Control Certificate shall be issued for the production run covering all the tests made. This shall include one set of the layout drawings showing all factory seams and repairs.

2.3 Liner Specifications

Property		Test Method	Result
Tensile at Break	Lbs/Sq In	ASTM D638	150
Tensile at Yield	"	Type IV	90
Elongation - Break	%	Dumbell	700
Elongation - Yield	%	2 ipm	13
Modulus Elasticity	Lbs/SqIn	ASTM D882	100k
Tear Resistance Initiation	Lbs/Min	ASTM 1004 Die C	25
Low Temperature Brittleness		ASTM D746 Procedure B	-100°F
Resistance to Soil Burial		ASTM D3083 per D638 above	
Tensile Strength B. & Y.			+/- 5%
Elongation at B & Y			+/- 10%
Puncture Resistance	Lbs	FTMS 101 B Method 2031	165
Environmental Stress Crack		ASTM D1693 (100°C)	1400 Hours

2.4 Weld Material The Vendor shall provide the necessary HDPE welding rod made from the same material as the liner. The welding rods shall be delivered with the liner in sealed containers that are clearly identified with Vendor's name, Project 8040, and identification numbers.

2.5 Production Defects Any holes, blisters, undispersed pockets of raw material, or other visible defects shall be patched with liner from this production run and fusion welded into place.

2.6 Factory Seams All factory seams shall be made by personnel trained in the use of the fusion welder. All factory seams and repairs shall be tested prior to shipment by ultrasonic tester, air pressure test (5 psig), or Vacuum Tester.

End of Spec. 8040-4

1. GENERAL

1.1 Vendor Requirements The Vendor of the liner shall be directly responsible for it's proper installation. He shall provide field supervision of the installation. The workers doing the field seaming shall be regular employee's of the Vendor and shall have at least 6 months prior experience in field seaming for the Vendor.

1.2 Surface Acceptance The Vendor shall inspect the surface as prepared by the Contractor and provide Monsanto and the QAO with a written acceptance of the surface or a list of corrections required. After the corrections, if any, a letter of acceptance shall then be provided.

2. INSTALLATION CONDITIONS

2.1 The Vendor shall maintain the surface in proper condition after acceptance.

2.2 The Vendor shall provide instructions to all site personnel as to proper shoes and care to take to prevent the puncture of the liner.

2.3 The liner shall be installed so that there will be neither tension or wrinkles at the temperature of final use.

2.4 Adjacent panels of the liner shall be overlapped at least 4 inches prior to seaming. The seam area shall be clean and free of moisture, dust, dirt debris, or other foreign material prior to and during the seaming operation.

2.5 No liner shall be placed over saturated areas, in ponded water, or when it is raining.

2.6 Field seams shall not be made when the ambient temperature is below 35 °F. If the ambient temperature is below 50 °F, the liner shall be heated by the sun or suitable hot air devices prior to any field seaming.

2.7 Each unit for extrusion welding shall have temperature gauges indicating the temperature of the extrudate in the gun and at the nozzle. The Vendor shall provide the minimum and maximum acceptable temperatures for each.

1. GENERAL

The contractor shall return with the bid an outline of what field testing, such, as but not limited to, pocket penotrometer etc. test he plans to use to assure that the work is being properly done between the tests required elsewhere in the specifications. This can include such items as requiring a minimum number of passes with the equipment, etc.

1.1 Clay Cap The contractor shall construct a test area cap at least 24 inches thick as outlined in the EPA 'Quality Assurance' Manual referenced in Spec. 8040-11 and detailed in Specification 8040-2 Section 3.6.6.

1.2 Liner Control

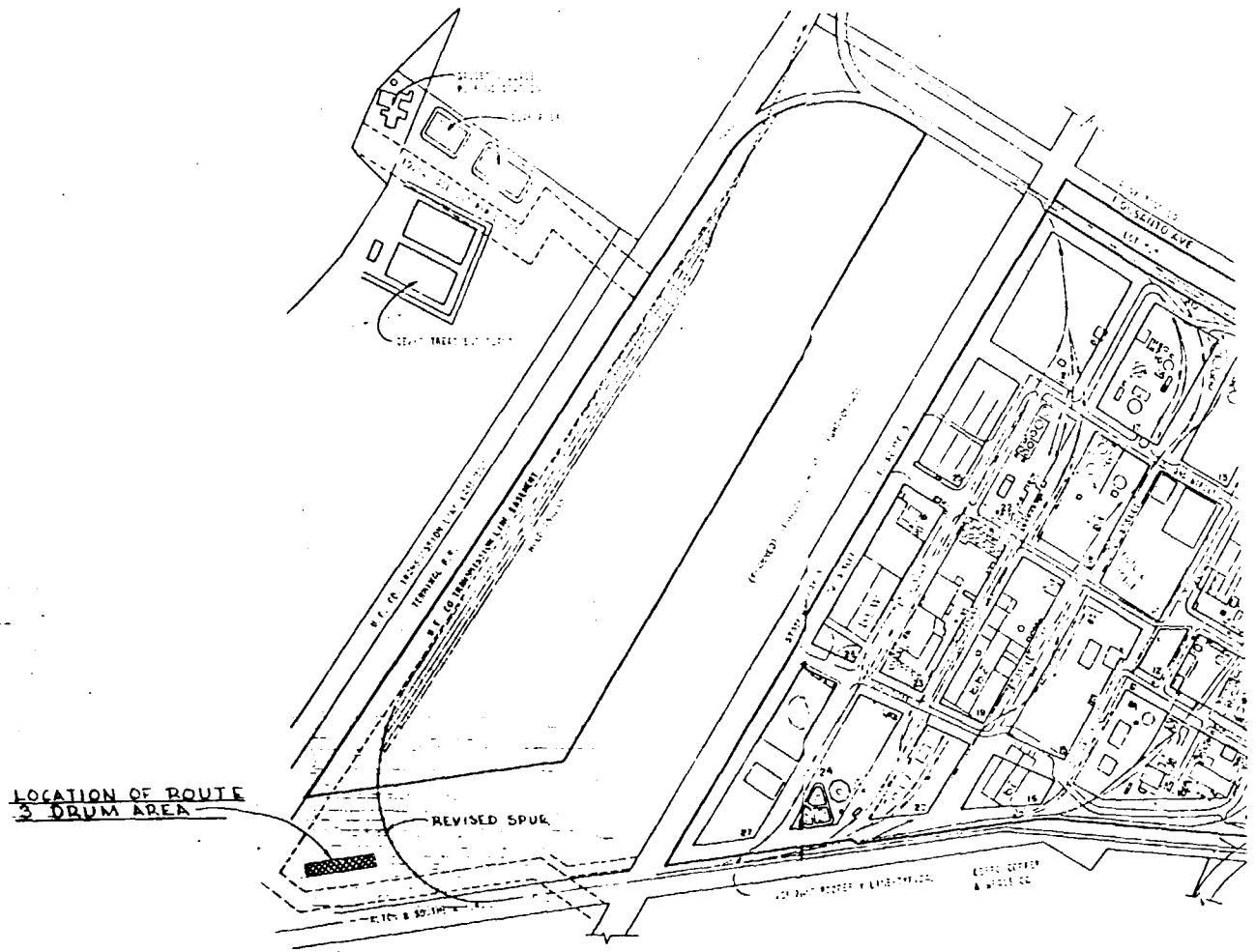
The liner Vendor shall be responsible for all quality control of the liner during its installation. The Contractor shall provide such assistance to the liner Vendor as has been arranged between them outside this scope of work.

1.3 Follow-up Work

On the completion on the liner or sections thereof, the contractor shall place the rest of the cap over the liner. His work shall be done in such a maner as to prevent any damage to the liner by his actions.

Any damage discovered during construction after the liner has been placed and accepted by Monsanto shall be repaired by the liner Vendor at the expense of the Contractor.

End of Spec. 8040-12



D	ISSUED FOR BID	
A	REVIEW	

Monsanto

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M.E.C. | W.G. KRUMME

CIVIL
SITE PLAN
ROUTE 3 DRUM AREA

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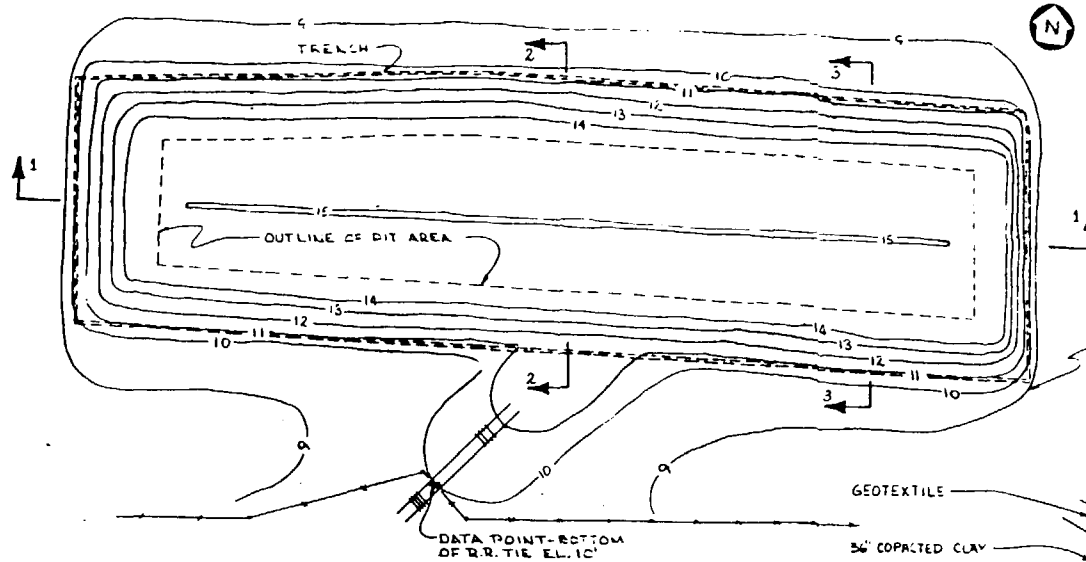
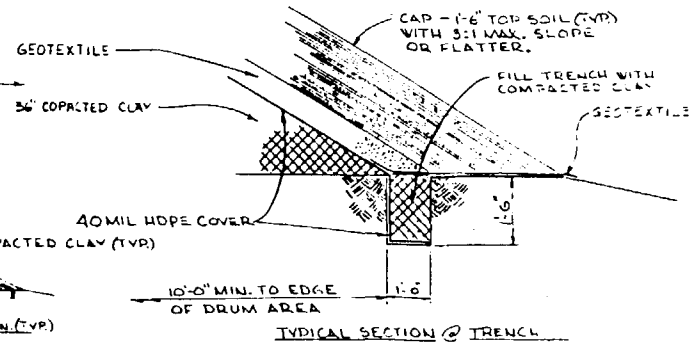
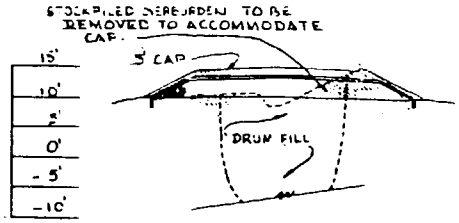


GRADING PLAN
SCALE: 1" = 20'

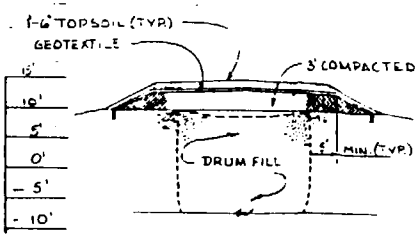
NOTES:
1. GRADE ELEVATIONS GIVEN INCLUDE FILL OR CUT TO GRADE PIT AREA TO ACCOMMODATE ELEVATIONS.



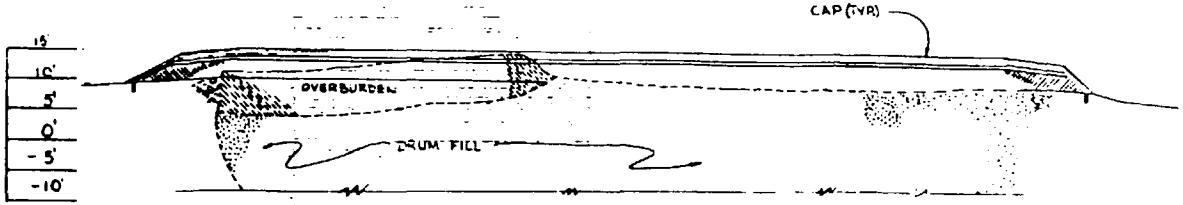
TYPICAL SECTION @ TRENCH



SECTION "2-2"



SECTION "3-3"



SECTION "1-1"

B	-		ISSUED FOR BID
A	-		REVIEW

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MCC

CIVIL
PLOT PLAN
ROUTE 3 DRUM AREA

3040	03	D	00.000	C	2	B